

CLAIMS

What is claimed is:

1. A microwave oven, comprising:
a transformer assembly accommodating a transformer and filled with a cooling material to cool the transformer; and
a temperature-sensitive switch electrically connected to the transformer to shut off power when a temperature of a surface of the transformer assembly is a predetermined overheating temperature.
2. The microwave oven of claim 1, wherein the temperature-sensitive switch is mounted on an outside of the transformer assembly.
3. The microwave oven of claim 1, wherein the temperature-sensitive switch is a thermostat that turns off at the overheating temperature.
4. The microwave oven of claim 1, wherein the overheating temperature ranges from about 80°C to about 150°C.
5. The microwave oven of claim 1, further comprising a primary coil in the transformer that receives an input voltage, wherein the temperature-sensitive switch is connected in series to the primary coil of the transformer.
6. The microwave oven of claim 1, further comprising a secondary coil in the transformer that receives and increases an input voltage, wherein the temperature-sensitive switch is connected in series to the secondary coil of the transformer.
7. The microwave oven of claim 1, wherein the temperature-sensitive switch comprises:
a body containing a reactive material that is sensitive to temperature and that selectively opens and closes contacts in the body;
a connecting terminal attached to a top of the body and electrically connected to an external controller;
a support attached to a bottom of the body; and
a holder attached to a top of the transformer assembly to firmly hold the support.

8. A microwave oven, comprising;
a cooking cavity;
an electrical components area partitioned from the cooking cavity;
a magnetron disposed in the electrical components area to radiate high frequency waves to the cooking cavity;
a transformer in the electrical components area to apply a voltage to the magnetron;
a container to accommodate the transformer, filled with a cooling material to cool the transformer, and having a base attached to the electrical components area; and
a temperature-sensitive switch electrically connected to the transformer to shut off power when a temperature of a surface of the transformer is a predetermined overheating temperature.

9. The microwave oven of claim 8, wherein the temperature-sensitive switch is mounted on an outside of the container.

10. The microwave oven of claim 8, wherein the temperature-sensitive switch is a thermostat that turns off at the overheating temperature.

11. The microwave oven of claim 8, wherein the overheating temperature ranges from about 80°C to about 150°C.

12. The microwave oven of claim 8, further comprising a primary coil in the transformer that receives an input voltage, wherein the temperature-sensitive switch is connected in series to the primary coil of the transformer.

13. The microwave oven of claim 8, further comprising a secondary coil in the transformer that receives and increases an input voltage, wherein the temperature-sensitive switch is connected in series to the secondary coil of the transformer.

14. The microwave oven of claim 8, wherein the base forms a bracket and is attached to a surface of the electrical components area.

15. The microwave oven of claim 14, wherein the base comprises a plate with two ends, and the base is formed by bending each end of the plate downwardly and inwardly to space the transformer from the surface of the electrical components area by a certain distance.

16. The microwave oven of claim 8, further comprising a separate bracket attached to the base.

17. The microwave oven of claim 16, wherein the base comprises a plate with two ends, and the base is formed by bending each end of the plate downwardly and outwardly to space the transformer from the surface of the electrical components area by a certain distance.

18. The microwave oven of claim 8, wherein the temperature-sensitive switch comprises:

- a body containing a reactive material that is sensitive to temperature and that selectively opens and closes contacts in the body;

- a connecting terminal attached to a top of the body and electrically connected to an external controller;

- a support attached to a bottom of the body; and

- a holder attached to a top of the transformer assembly to firmly hold the support.

19. The microwave oven of claim 8, wherein the container is made of copper or aluminum to dissipate heat generated from the transformer.

20. The microwave oven of claim 8, wherein the container comprises a cavity in an upper portion of an interior of the container to provide room for the cooling material to expand when heated by heat generated by the transformer.

21. The microwave oven of claim 8, further comprising:

- an input line connected to the transformer through a top of the container to provide external power to the transformer; and

- an output line connected to the transformer through the top of the container to provide power to the magnetron, the input line and the output line being connected to the top of the container using epoxy resin to keep the container tightly sealed.

22. The microwave oven of claim 8, further comprising:
a terminal unit attached to a top of the container;
an input line connected to the transformer through the terminal unit to provide external power to the transformer; and
an output line connected to the transformer through the terminal unit to provide power to the magnetron.

23. The microwave oven of claim 8, wherein the container comprises corrugated sidewalls to provide a larger heat dissipating area.

24. A temperature-sensitive switch for a microwave oven having a transformer housed within a container and a controller, comprising:
a body containing a reactive material that is sensitive to temperature;
a connecting terminal attached to a top of the body and electrically connected to the controller;
a support attached to a bottom of the body; and
a holder attached to a top of the container to receive and hold the support,
wherein the temperature-sensitive switch is electrically connected to the transformer to shut off power when a temperature of a surface of the transformer is a predetermined temperature.

25. A transformer assembly for a microwave oven having a magnetron, comprising:
a transformer to apply a voltage to the magnetron;
a container to house the transformer;
a cooling material within the container to cool the transformer;
a temperature-sensitive switch electrically connected to the transformer to shut off power when a temperature of a surface of the transformer is a predetermined temperature.

26. The transformer assembly of claim 25, further comprising a primary coil in the transformer that receives an input voltage, wherein the temperature-sensitive switch is connected in series to the primary coil of the transformer.

27. The transformer assembly of claim 25, further comprising a secondary coil in the transformer that receives and increases an input voltage and outputs the increased input voltage, wherein the temperature-sensitive switch is connected in series to the secondary coil of the transformer.

28. The transformer assembly of claim 25, wherein the cooling material is a liquid or a nonconductive oil.

29. The microwave oven of claim 23, further comprising a cooling fan that draws external cool air into the electrical components area to cool the transformer.